MISR Level 2 Aerosol/Surface Products Quality Statement
March 30, 2001

Quality Designator: Beta

Also see the Statement dated February 16, 2001 for MISR Level 2 Aerosol/Surface Products from February 16 to March 30, 2001.

This statement applies to MISR Level 2 Aerosol/Surface Products for March 30, 2001, and beyond until such a time as further improvements to MISR software are made.

An extensive review of product quality has not yet been performed. Please read the summary words of caution if you have not done so already.

In spite of all the warnings, the MISR Level 2 Aerosol/Surface software which generated these products is believed to be functioning quite well except where noted below. This statement highlights major known problems with the products, as well as functionalities which are currently not implemented.

Aerosol | Land | Ocean

---

 * * **Notice** * *
An operational error has caused TASC data from the incorrect month to be used during aerosol retrieval processing. This error occurred for data processed from [April 1, 2001] to [September 12, 2001]. The corresponding orbit numbers are [6840-9240]. This error will degrade aerosol retrieval accuracy. Based on analysis of the data, the average variations in optical depth caused by this error are: 96% of the incorrectly-retrieved optical depths are within 0.1 of the optical depths retrieved using the TASC Dataset for the correct month; 88% are within 0.01; 69% are within 0.001; and 57% are within 0.0001.

AEROSOL (a.k.a. AS_AEROSOL, MIL2ASAE) (from MISR PGE9)

ACP DEPENDENCY
The quality of the aerosol product depends upon the quality of the Ancillary Climatology Product (ACP). The ACP contains information on aerosol particle properties and mixtures of aerosols. Refer to the ACP quality statement for further information.

CLOUD DETECTION PROBLEMS
Cloud screening is performed prior to the aerosol retrievals. However, some clouds are currently not being detected. The user is cautioned to be aware of this. Cloud screening is currently performed with algorithms which use the angle-to-angle differences in radiances across MISR cameras. These algorithms are described in the Level 2 Aerosol Algorithm Theoretical Basis document. External cloud screens from other MISR products are not being used at the present time. Future product upgrades will include the use of external cloud screening information.

OPTICAL DEPTH UNCERTAINTIES
The optical depth uncertainties which are reported over land areas are too high, based upon limited comparisons with ground data. This will be fixed in a future release.

ARTIFACTS IN AEROSOL OPTICAL DEPTHS OVER LARGE SPATIAL AREAS
The retrieved aerosol optical depths occasionally contain artifacts which show up as large, block-shaped areas with identical optical depth values. This is due to a limitation of the current aerosol retrieval algorithm. A fix for this problem is planned for future versions.

TASC DEPENDENCY
The MISR TASC (Terrestrial Atmosphere and Surface Climatology) dataset provides information on the climatological conditions of the area being observed by the MISR instrument. This information is used during the aerosol retrieval process. The TASC dataset is gridded on a month-by-month temporal basis. In the future, this information will be obtained from more timely sources, e.g. the Data Assimilation Office (DAO).

An operational error has caused TASC data from the incorrect month to be used during aerosol retrieval processing. This error occurred for data processed from [April 1, 2001] to [September 12, 2001]. The corresponding orbit numbers are [6840-9240]. This error will degrade aerosol retrieval accuracy. Based on analysis of the data, the average variations in optical depth caused by this error are: 96% of the incorrectly-retrieved optical depths are within 0.1 of the optical depths retrieved using the TASC Dataset for the correct month; 88% are within 0.01; 69% are within 0.001; and 57% are within 0.0001.

ALGORITHM UPDATES
The aerosol retrieval algorithms described in the Algorithm Theoretical Basis document have been modified and improved, based on initial analyses of the data. The next release of the MISR Aerosol Retrieval Algorithm Theoretical Basis document will include an updated description of these algorithms.

DDV NOT AVAILABLE
The algorithm to retrieve aerosol properties over areas of dense, dark vegetation (DDV) is not implemented. Instead, the algorithm to retrieve aerosol properties over land areas of heterogeneous reflectances is used.

LAND SURFACE (a.k.a. AS_LAND, MIL2ASLS) (from MISR PGE9)

AEROSOL DEPENDENCY
The land surface product relies on the aerosol product for atmospheric correction information. Therefore, the quality of the land product depends upon the quality of the aerosol product. Refer to the aerosol section for further information.

At the current time land surface retrievals, particularly for low albedo surfaces, should be considered most reliable where aerosol optical depths are low (< 0.1). Thus, it is recommended that users examine the 'Regional Mean Optical Depth' parameter in the Aerosol Product as part of their assessments of the surface parameters. Continuous refinements in the quality of the aerosol retrievals over land are planned for future releases and these are expected to result in improvements in the land product quality at larger optical depths.

FILL VALUES IN LAND SURFACE REFLECTANCES
Land surface reflectances are computed separately for each MISR spectral band. In some cases, the land retrievals succeed in one MISR band, but not another. This can cause visualization problems when viewing a composite image of land surface reflectances which contains spectral bands for both successful and unsuccessful retrievals. As the land surface retrievals improve in the future, this problem should lessen.

LAI/FPAR NOT YET AVAILABLE
The algorithms to compute leaf-area index (LAI) and fraction of photosynthetically active radiation (FPAR) are not yet implemented.

OCEAN (a.k.a. AS_OCEAN, MIL2ASOS) (from MISR PGE9)

OCEAN NOT YET AVAILABLE
The Ocean Surface product, which contains surface reflectance properties over ocean, has not been implemented. It is unavailable at this time.